Christian Calculus

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The Impact of Christian Faith on Mathematics & Science: Yesterday & Today

Rogers 109 (Engineering Building), September 29, 5:30-7:00pm



FREE PIZZA & DRINKS!

Dr. Robert J. Marks II, Distinguished Professor of Electrical and Computer Engineering

The New Atheism claims being a scientist and a Christian is like being a vegan butcher.

But both today and in history, many scientists, mathematicians and engineers are motivated in their work by the uncovering of t precise orderliness, underlying simplicity, and inherent beauty of God's creations. Many not only study the creation, but have pursued the identity of the Creator and have found Him in the foundational tenets of Christianity. Some of these scientists are:

- Isaac Newton the father of classical physics and co-creator of calculus
- Michael Faraday the founder of electrical engineering
- Blaise Pascal mathematician extraordinaire and inventor of the first computer
- o Leonhard Euler the most prolific mathematician of all time
- o George Washington Carver the "father of the peanut"
- Louis Pasteur the father of microbiology
- Thomas Bayes the founder of statistical inference
- James Clerk Maxwell the formulator of electromagnetics
- o Francis Collins Director of the Human Genome Project
- o and on and on...



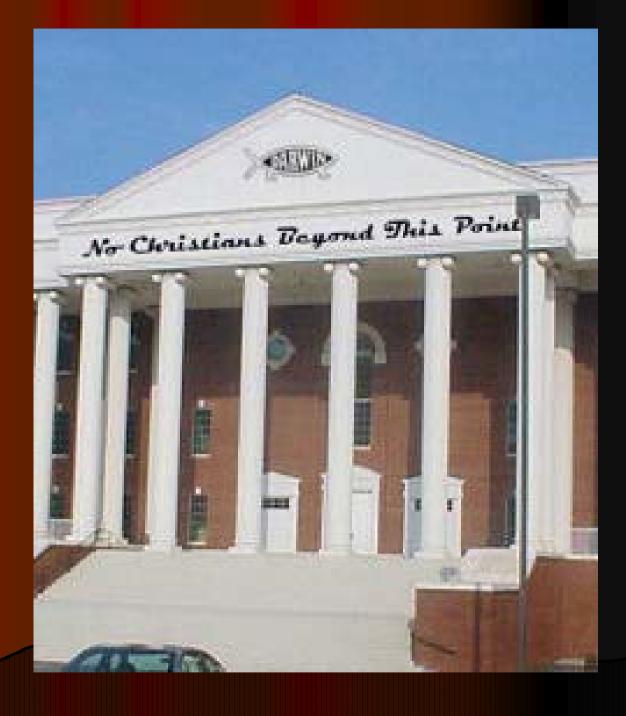
Sponsored by the American Scientific Affiliation (Baylor Student Chapter); the School of Engineering & Computer Science; the Departments of Electrical & Mechanical Engineering



In 2010, Dr. Marks was listed by CollegeCrunch.com as one of "The 20 Most Brilliant Christian Professors," and, in 2013, one of "the 50 smartest people of faith" at TheBestSchools.org.

Marks is the recipient of numerous professional awards, including a NASA Tech Brief Award and a bes paper award from the American Brachytherapy Society for prostate cancer research. He is Fellow of both IEEE and The Optical Society of America His consulting activities include Microsoft Corporation, Pacific Gas & Electric, and Boeing Computer Services. His research has been funded by organizations such as the National Science Foundation, General Electric, Southern California Edison, EPRI, the Air Force Office of Scientific Research, the Office of Naval Research, the Whitaker Foundation, Boeing Defense, the National Institutes of Health, The Jet Propulsion Lab, Army Research Office, and NASA.

The Silent Purge



THE WALL STREET JOURNAL. OPINION

HOUSES OF WORSHIP

A Campus Crusade Against the Constitution

Limiting First Amendment rights for Christians undercuts rights for everyone else.



By HARVEY A. SILVERGLATE

Sept. 18, 2014 7:01 p.m. ET

In my lifetime I have been fortunate to see private associations within civil society promote astonishing social and political advancements in civil rights for African-Americans, women and gays. The voices of a like-minded minority, when allowed to associate and present a unified message, can be powerful. Yet we cannot pick and choose which groups have rights. Thus the current controversy surrounding evangelical Christian organizations on college campuses is a test of our commitment to liberal and constitutional ideals.

Earlier this month the California State University System "de-recognized" 23 campus chapters of the InterVarsity Christian Fellowship (IVCF). This decision stems from a December 2011 chancellor's executive order stating that "No campus shall recognize any . . . student organization unless its membership and leadership are open to all

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Cal State University strips official status from InterVarsity Christian **Fellowship**

Bu Josh Dulanev

LA Daily News

POSTED: 09/28/2014 09:27:41 PM PDT

By Josh Dulaney, LA Daily News

After refusing to eliminate a requirement that leaders affirm a doctrine of faith, a Christian student organization has returned to Cal State University this fall without the financial help, recruitment opportunities and community standing other groups enjoy.

InterVarsity Christian Fellowship chose not to comply with a 2011 executive order signed by former Chancellor Charles B. Reed that prohibits CSU schools from recognizing any student group that denies membership and leadership to students based on a variety of factors, including religion. The well-known group, while welcome on campus, no longer has official club status in the 23-campus system.

While the organization — which opened its first chapter in 1947 in San Luis Obispo and lists CSU chapters at Pomona, Northridge, Los Angeles and Long Beach among others — is open to all students, its bylaws require chapter leaders to agree with the organization's doctrine.



Chante Shazel (center) joins other members of the CSULB InterVarsity Christian Fellowship in...

Science and Faith: Separate But Equal? Answer...





The New Atheists





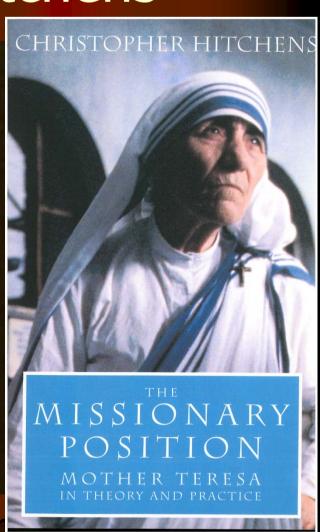
"Christian theism must be rejected by any person with even a shred of respect for reason" George H. Smith, Atheist Philosopher

Peter Atkins



Religion is Evil? Christopher Hitchens





Richard Dawkins



THE INTERNATIONAL BESTSELLER

RICHARD Dawkins

GOD

"A very important book, especially in these times . . . a magnificent book, lucid and wise, truly magisterial" Ian McEwan



Richard Dawkins



P.Z. Myers

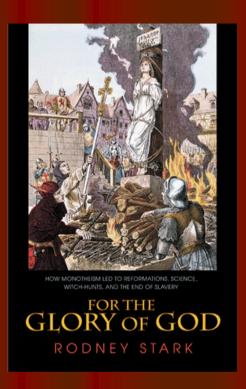


William Provine









Rodney Stark

Nothing new under the sun: "The falsehood that science required the defeat of religion was proclaimed by such self-appointed cheerleaders as Voltaire, Diderot, and Gibbon who themselves played no part in the scientific enterprise - a pattern that continues."

How does New Atheism position about science vs. faith stand up to history?



HISTORY OF SCIENCE...



"... the Christian world ... gave birth in a clear, articulate fashion to the experimental method of science itself."

Loren Eiseley, "Darwin's Century" (Garden City, NY, Doubleday, 1958, Doubleday Anchor Books, 1961), p.62.

HISTORY OF SCIENCE

"... Hebrew and Christian belief in a deity who was at once a Creator and Lawgiver rendered [the idea of the 'laws of nature'] valid.'

A.R. Hall, Historian



HOW MONOTHEISM LED TO REFORMATIONS, SCIENCE, WITCH-HUNTS, AND THE END OF SLAVERY

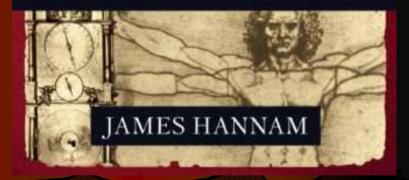
GLORY OF GOD

RODNEY STARK

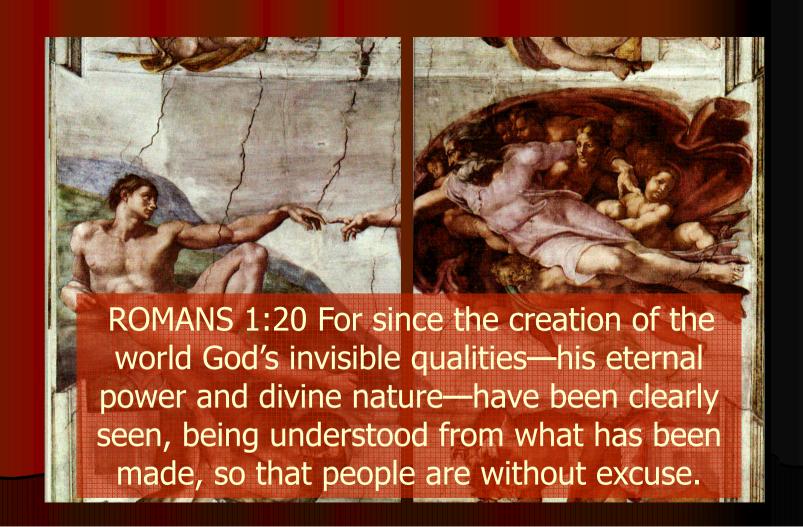


THE GENESIS OF SCIENCE

HOW THE CHRISTIAN MIDDLE AGES LAUNCHED THE SCIENTIFIC REVOLUTION



Why Christians? In Science & Math, Researchers see God's Laws in Creation.



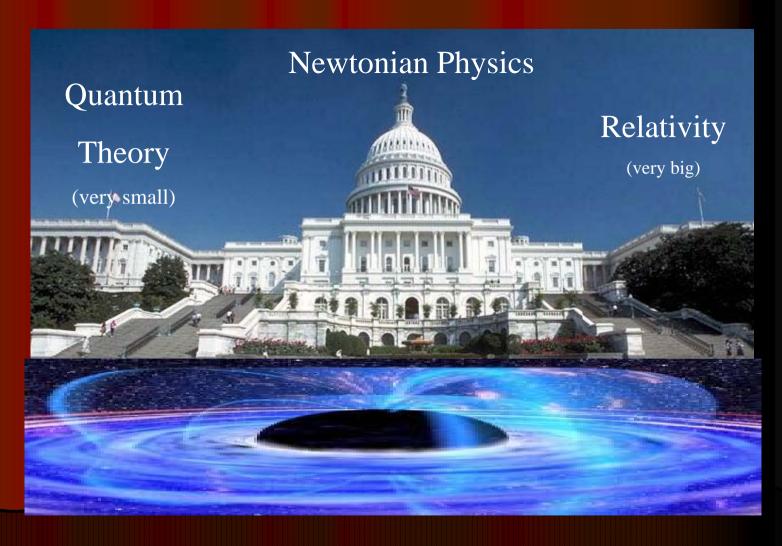


 "The more I study nature, the more I stand amazed at the work of the Creator. Into his tiniest creatures, God has placed extraordinary properties ..."
 Louis Pasteur (1822-1895)

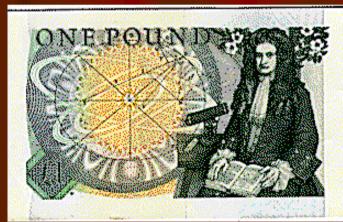
Biography's Top 100 Persons of the Millennium Gutenberg, Johann Newton, Isaac -Luther, Martin 2. Isaac Newton Darwin, Charles Harvey, William Shakespeare, William Pope Gregory VII Columbus, Christopher The father of classical physics. **Tubman. Harriet** Marx, Karl Bolivar, Simon Co-Discoverer of Calculus 8. Einstein, Albert Princess Diana Copernicus, Nicolaus wright brothers Fermi Enrico 10. Galileo Galilei Gates, Bill Da Vinci, Leonardo Mendel, Green **Blaise Pascal** 12. Freud. Sigmund Mao. Pasteur, Louis Bell, Alexand The father of computer engineering Edison, Thomas William the (15. Jefferson, Thomas Machiavelli Niccolo Elizabeth I Hitler, Adolf Babbage Mandela, Nelson Gandhi, Mahatma **Bohr. Neils** 13. Louis Pasteur 18, Locke, John Peter the Great of Russia Michelangelo Marconi, Guglielmo The father of microbiology 20. Smith. Adam Reagan, Ronald Washington, George Joyce, James Khan, Genghis Curie, Marie Lincoln, Abraham Polo. Marco **James Clerk Maxwell** 24 Aguinas St Thomas Magellan, Ferdin anton, Elizabe The founder of electromagnetics **Thomas Bayes** eslev. Elvis an of Arc The founder of statistical inference Nightingale, Florence nt, Immanuel Roosevelt, Eleanor Ford, Henry Roosevelt, Franklin D. **Patient Zero** Beethoven, Ludwig Von Faraday, Michael Chaplin, Charlie Disney, Walt Watson & Crick Caruso, Enrico Descartes, Rene **Austen** Salk King, Martin Luther Jr. ouis 61. Michael Faraday Rousseau, Jean-Jacques sco The father of electrical engineering Franklin, Benjamin

Sir Isaac Newton (1642-1727)

"...one of the greatest names in the history of human thought"



Sir Isaac Newton Contributions











1687

"Математические начала натуральной философий—вершина творчества И.Ньютона.
Впервые была создана единая система земной и небесной механики, которая легла в основу классической физики.







Sir Isaac Newton Contributions

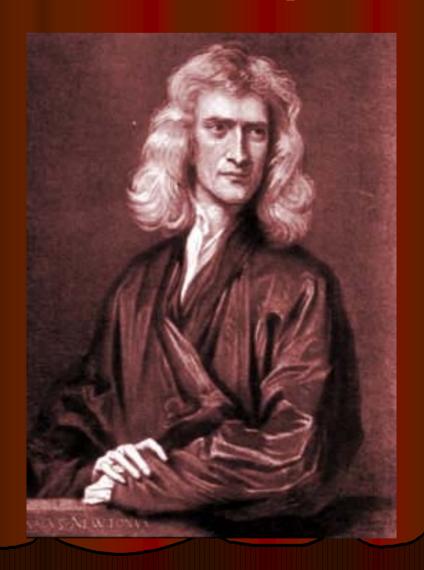
Newton (mks unit for force) Newton's Three Laws of Motion Newton's rings Newton Optimization Newtonian Physics Newtonian Fluid Newton Raphson Method Newtonian telescope **Newtonian dynamics** Newtonian constant of gravitation = $6.67259 \times 10-11$ m3 kg-1 s-2

God observed in nature...

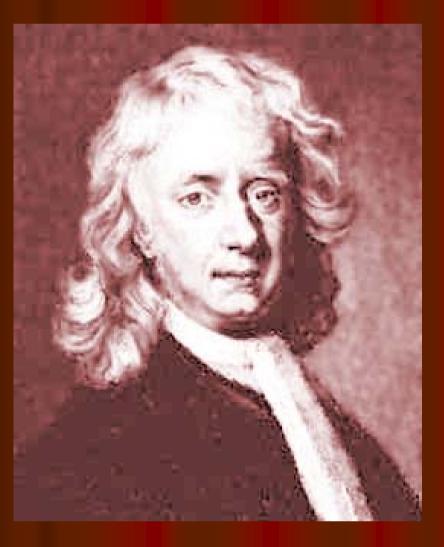
"[The] beautiful system of the the sun, planets and comets could only proceed from the councel and dominion of an intelligent and powerful Being."

Isaac Newton

From Opticks by Isaac Newton



"God in the beginning formed matter in solid, massy, hard, impenetrable, moveable particles, of such sizes and figures, and with other such properties, and in such proportion to space, as most conduced to the end for which He formed them."



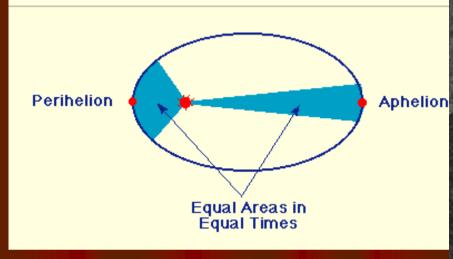
Newton on Atheism

"Atheism is so senseless and odious to mankind that it never had many professors."

Johannes Kepler (1571-1630)

Kepler's Laws

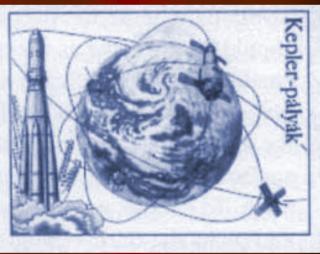
II. The line joining the planet to the Sun sweeps out equal areas in equal times as the planet travels around the ellipse.





Johannes Kepler (1571-1630)

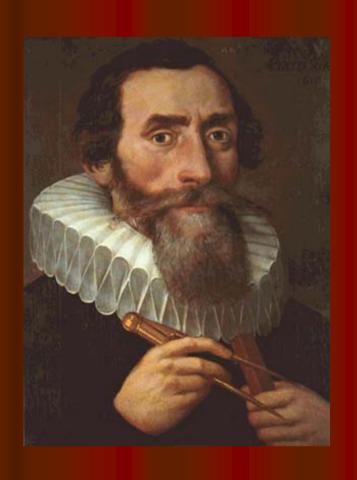




- Kepler's Laws
- III. The ratio of the squares of the revolutionary periods for two planets is equal to the ratio of the cubes of their semimajor axes.

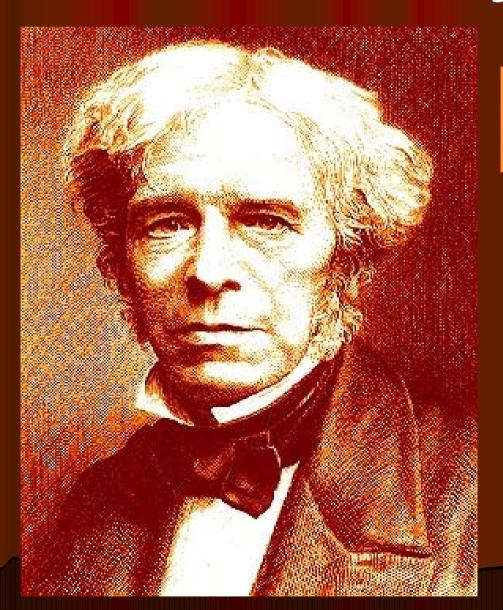
$$\frac{P_1^2}{P_2^2} = \frac{R_1^3}{R_2^3}$$

Johannes Kepler



"When asked: Why do you do science?", Kepler answered that he desired in his scientific research to obtain a sample test of the delight of the Divine Creator in his work and to partake of his joy."

Michael Faraday (1791-1867)



$$\oint \mathbf{E} \cdot d\mathbf{r} = -\frac{d}{dt} \iint_{S} \mathbf{B} \cdot d\mathbf{A}$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$F = N_{\rm A}e$$

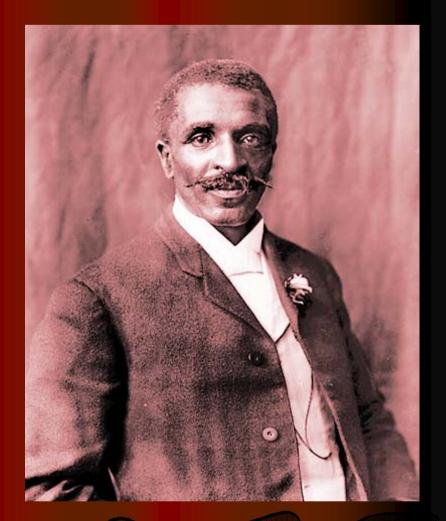


"...enabling the mind to apply the natural power through law... conveys the gifts of God to man."

George Washington Carver

"God is going to to reveal to us things He never revealed before if we put our hands in His."

Named his research lab *God's Little Workshop*.

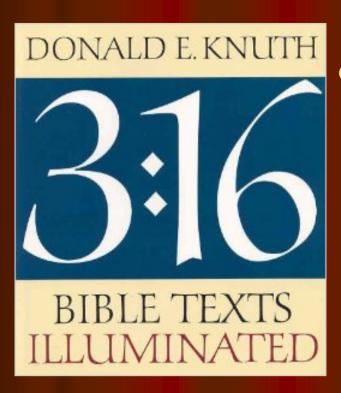


Donald Knuth



- Computer Scientist
 Extraordinaire
- "The father computer science"
- Authored multi volume "The Art of Computer Programming"
- Knuth is the creator of the Tex computer typesetting system

Donald Knuth

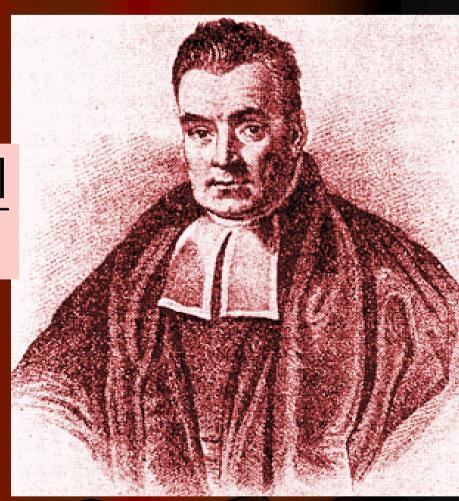


- Knuth studied the Bible like he graded student's programing.
- "It's tragic that scientific advances have caused many people to imagine that they know it all, and that God is irrelevant or nonexistent. The fact is that everything we learn reveals more things that we do not understand... Reverence for God comes naturally if we are honest about how little we know."

Thomas Bayes (1702 – 1761)

Bayes Theorem

$$P[A \mid B] = \frac{P[B \mid A]P[A]}{P[B]}$$



James Clerk Maxwell (1831 –1879)



James Clerk Maxwell

$$\nabla \cdot \vec{D} = \rho$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$\nabla \cdot \vec{B} = 0$$

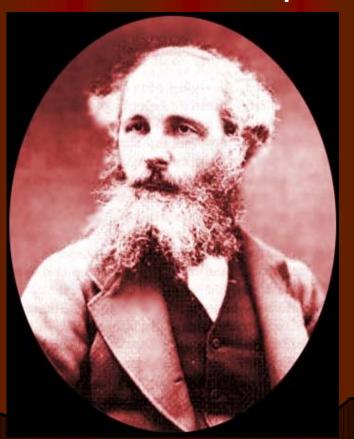
$$\nabla \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$$

Maxwell's Equations



James Clerk Maxwell

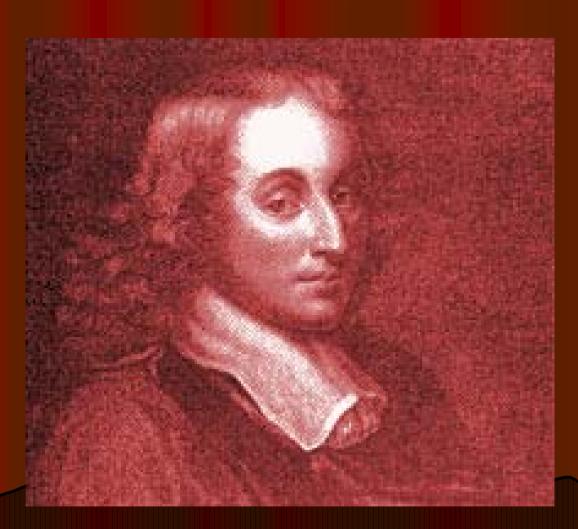
"The only desire which I can ...have is, like David to serve my own generation by the will of God, and then fall asleep." Maxwell (near death).



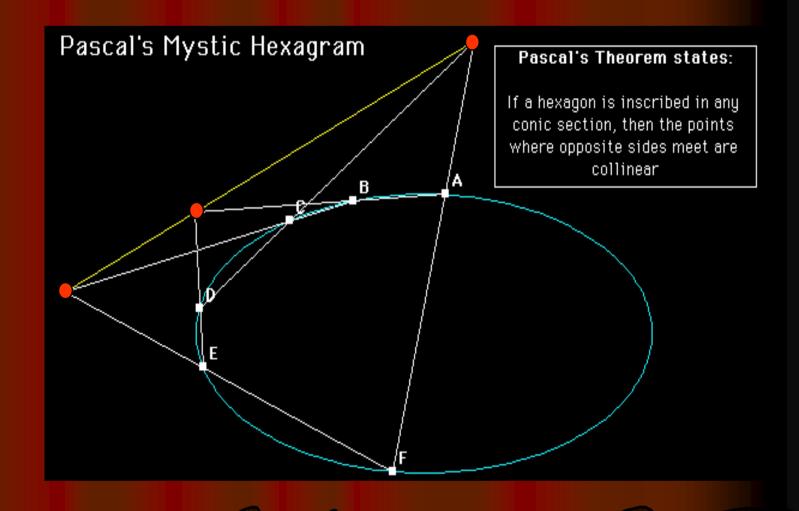
"I believe ... that 'Man's chief end is to glorify God and to enjoy Him for ever'."

Blaise Pascal

(1623-62)



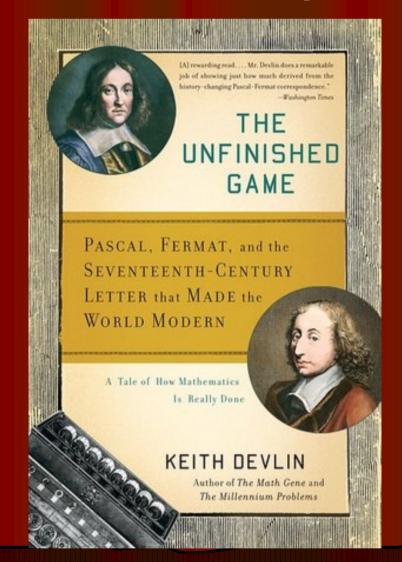
Pascal: the Mathematician



Pascals Imangle

```
1 2 1
      1 3 3 1
     1 4 6 4 1
    1 5 10 10 5 1
  1 6 15 20 15 6 1
7 1 7 21 35 35 21 7 1
```

Probability



Pascaline Calculator



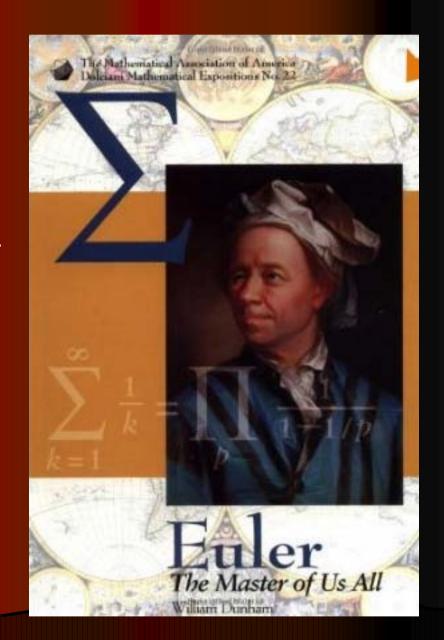
Leonhard Euler

 e^{x}

 $\cos(x) + j\sin(x) = e^{jx}$



polyhedra: v - e + f = 2



Euler angles defining a rotation in space.

Euler approximation

Euler brick

Euler characteristic in algebraic topology and topological graph theory, and the corresponding Euler's formula

Euler circle

Eulerian circuit

Euler class

Euler's constant

Euler cycle

Euler's criterion

Euler derivative

Euler diagram

Euler's disk

Eulerian graph

Euler-Rodrigues parameters

The Euler integrals of the first and second kind, namely the beta function and gamma function.

Euler's line – relation between triangle centers

Euler-Mascheroni constant or

Euler's constant $\gamma \approx 0.577216$

Eulerian matroid

Euler's number, e, the base of the natural logarithm.

Euler operator – set of functions to create polygon meshes

Euler parameters

Eulerian path, a path through a graph that takes each edge once.

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Euler pseudoprime

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Euler's rule

Fuler transform Euler's formula e ix = $\cos x + i$ sin x in complex analysis. Euler's formula for planar graphs or polyhedra: v - e + f = 2Euler's formula for the critical load of a column Euler's continued fraction formula Euler product formula – for the Riemann zeta function. Euler-Maclaurin formula (Euler's summation formula) Euler-Rodrigues formulas **Euler's homogeneous function** theorem Euler's totient function Euler hypergeometric integral Euler's identity $e i\pi + 1 = 0$. Euler's four-square identity

Euler's number, e ≈ 2.71828, Euler's idoneal numbers Euler numbers are an integer sequence.

Euler number (physics), the cavitation number in fluid dynamics.

Euler number (topology) – now, Euler characteristic

Euler–Mascheroni constant Eulerian integers are the numbers of form $a+b\omega$ where ω is a complex cube root of 1.

Euler's homogeneous function theorem

Euler's infinite tetration theorem

Euler's rotation theorem Euler's theorem (differential geometry) Euler's theorem in geometry, relating the circumcircle and incircle of a triangle.

Euclid-Euler theorem

Euler-Fermat theorem

Euler's adding-up theorem in economics

Euler's first law about the linear momentum of a body

Euler's second law about the sum of the external moments about a point



Leonhard Euler

"For since the fabric of the universe is most perfect and the work of a most wise Creator, nothing at all takes place in the universe in which some rule of maximum or minimum does not appear."



Were all motivated by belief in

God?

Pierre Simon Laplace (1749-1827).

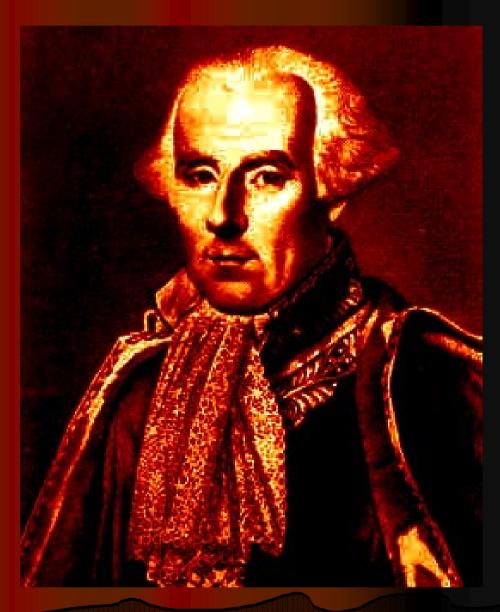
$$X(s) = \int_0^\infty x(t)e^{-st}dt$$



Napoleon asked
Laplace why God was
not mentioned in any
of his work on celestial
mechanics. Laplace
responded ...

"Sire, je n'avais pas besoin de cette hypothese."

"Sire, I had no need of that hypothesis."



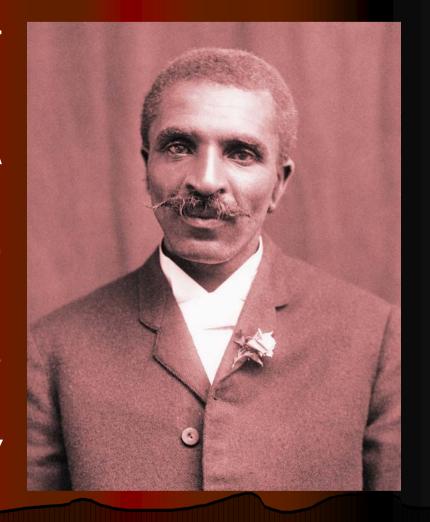
Theist # Christian

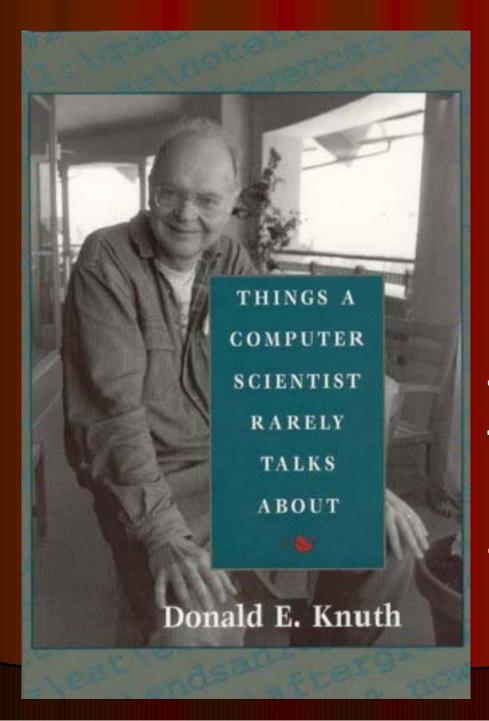
Christian: The knowing of God, the creator of the universe, personally. Belief in God's supremacy and saving grace made possible through the sacrifice of His son, Jesus Christ.

What were the belief of these theist scientist?

George Washington Carver

"JESUS SAID ONE MUST BE BORN AGAIN, MUST BECOME AS A LITTLE CHILD. [YOU] MUST LET NO LAZINESS, NO FEAR, NO STUBBORNNESS KEEP [YOU] FROM [YOUR] DUTY."





Donald Knuth "Everyone who has faith – a personal trust that Jesus is God's Son has eternal life [and] lives forever"

"There is one God, the Father, ever-living, omnipresent, omniscient, almighty, the Maker of heaven and earth, and one Mediator between God and man, the man Christ Jesus...."

Sir Isaac Newton

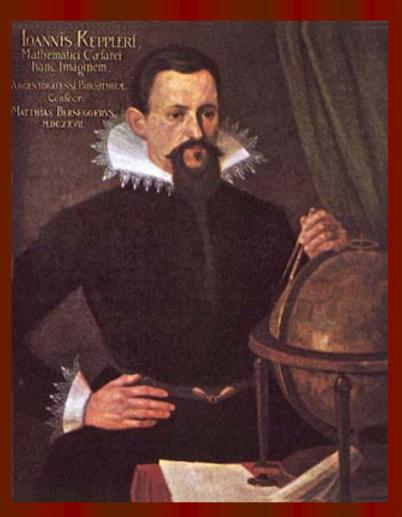


"We account the Scriptures of God to be the most sublime philosophy. I find more sure marks of authenticity in the Bible than in any profane history whatsoever... Worshiping God and the Lamb [Jesus **Christ] in the temple: God,** for his benefaction in creating all things, and the Lamb, for his benefaction in redeeming us with his blood."



Sir Isaac Newton

Johannes Kepler



"I believe only and alone in the service of Jesus Christ. In Him is all refuge and solace."

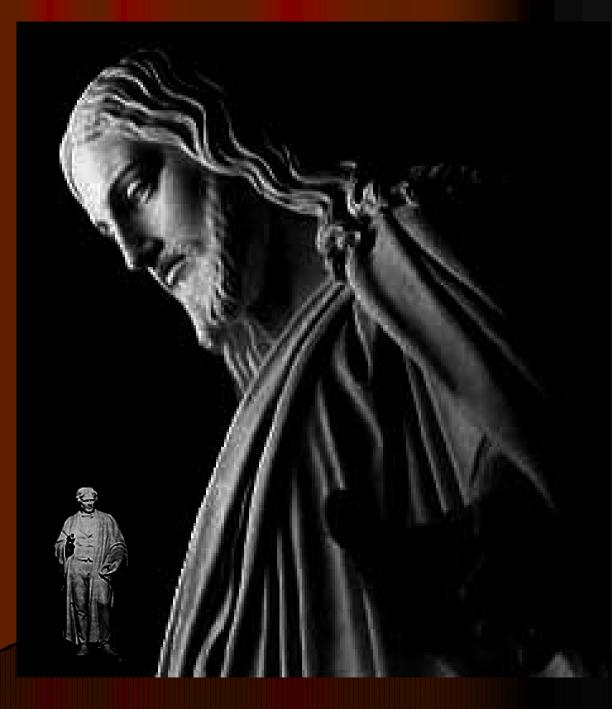


"[T]hough the thought of death brings the thought of judgment, it also brings to the Christian thought of Him [Jesus Christ] who died, ... [and] rose again for the justification of those who believe in Him." **Michael Faraday**

"Speculations! I know nothing about speculations. I'm resting on certainties. 'I know my Redeemer liveth' and because He lives I shall also live." purported to Faraday near death when queried by reporters about "speculations" of life after death.

"Christ [is] the power of God and the wisdom of God. The Christian religion is a revelation and that revelation is the Word of God."

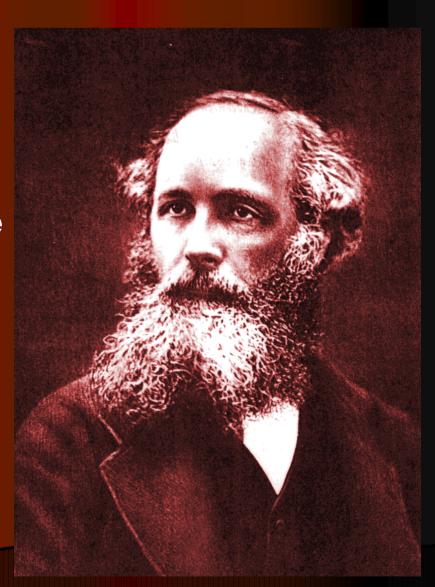
Michael Faraday



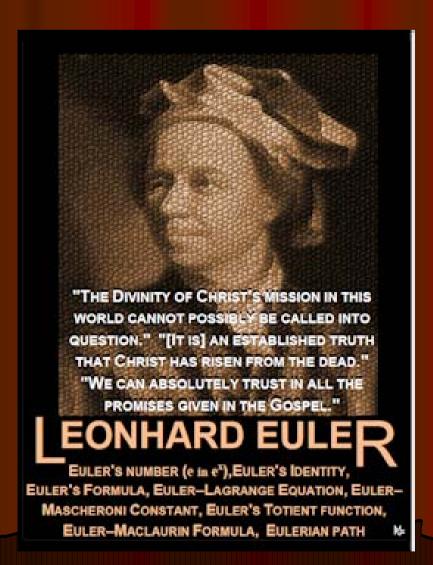
James Clerk Maxwell

"Think what God has determined to do to all those who submit themselves to his righteousness and are willing to receive his gift [of eternal life in Jesus Christ]. They are to be conformed to the image of his Son and when that is fulfilled and God sees they are conformed to the image of Christ, there can be no more condemnation."

James Clerk Maxwell.



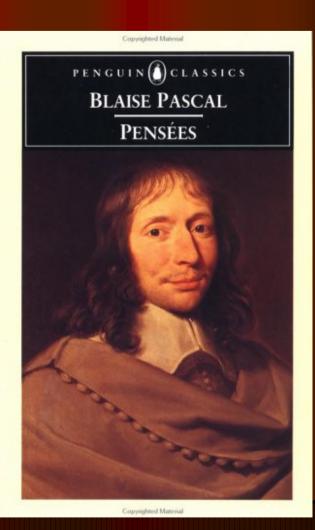
Leonhard Euler



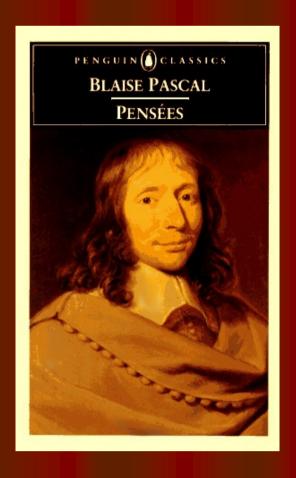
- 1. "THE DIVINITY OF CHRIST'S MISSION IN THIS WORLD CANNOT POSSIBLY BE CALLED INTO QUESTION."
- 2. "[IT IS] AN ESTABLISHED TRUTH THAT CHRIST HAS RISEN FROM THE DEAD."
- 3. "WE CAN ABSOLUTELY TRUST IN ALL THE PROMISES GIVEN IN THE GOSPEL."

Blaise Pascal

PENSE'ES M. PASCAL SUR LA RELIGION ET SUR QUELQUES AUTRES SUJETS, Qui ont esté trouvées après sa mort parmy fes papiers. SECONDE E'DITION. A PARIS, Chez Guillaums Despatz, më Saint Jacques , à Saint Prosper. M. DC. LXX. Avec Privilege & Approbation.



Blaise Pascal



"We know God only through Jesus Christ... through Jesus Christ we know God. All who have pretended to know God, and prove **Him without Jesus** Christ, have only had impotent proofs."

"There is a God-shaped vacuum in the heart of every man,

which only God can fill through His Son Jesus Christ."



"How can anyone lose who chooses to become a Christian? If, when he dies, there turns out to be no God and his faith was in vain, he has lost nothing - in fact, he has been happier in life than his nonbelieving friends. If, however, there is a God and a heaven and hell, then he has gained heaven and his skeptical friends will have lost everything in hell!"

Henry H. Morris, Men of Science-Men of God (El Cajon, CA: Master Books, A Division of Creation Life Publishers, Inc., 1988), pp. 15-16.

Pascal's Wager: A Venn Diagram

You Believe!

You Don't Believe.

No God At least you led a good life!



Life with limited purpose



God Exists Eternity
With
God!



Eternity Without God



Pascal's Conversion

Pascal's conversion to Christianity. Found in the lining of his coat on his death

Monday, Nov 23, 1654

Certitude.
Certitude.
Feeling. Joy.
Peace.

God of Jesus
Christ.
"Thy God and
my God." (Jn
20:17)
Forgetfulness
of the world and
of everything,

except God.

"Memorial

In the year of grace, 1654, On Monday, 23rd of November, Feast of St Clement, Pope and Martyr,

And others in the Martyrology,
Vigil of St Chrysogonus, Martyr, and others,
From about half past ten in the evening until about
half past Twelve,

Fire!

God of Abraham, God of Isaac, God of Jacob, (Ex 3:6; Mt 22:32)

Not of the philosophers and scholars.
Certitude. Certitude. Feeling. Joy. Peace.
God of Jesus Christ.
"Thy God and my God." (Jn 20:17)

Forgetfulness of the world and of everything, except God.

He is to be found only in the ways taught in the Gospel.

Greatness of the Human Soul.

"Righteous Father, the world hath not known Thee, But I have known Thee." (Jn 17:25)

Joy, joy, joy, tears of joy. 🔻

I have separated myself from Him.

"They have forsaken Me, the fountain of living waters." (Jn 2:13)

"My God, wilt Thou leave me?" (Mt 27:46)
Let me not be separated from Him eternally.

"This is eternal life, That they might know Thee, the only true God, And Jesus Christ, whom Thou hast sent." (Jn 17:3) Jesus Christ...

Let me not be separated from Him eternally. "This is eternal life, That they might know Thee, the only true God, And Jesus Christ, whom Thou hast sent." (Jn 17:3)

Joy, joy, joy, tears of joy.

Pascal's Conversion (cont)

"Jesus Christ

I have separated myself from Him:
I have fled from Him,
denied Him,
crucified Him.

Let me never be separated from Him.
We keep hold of Him only by the ways taught in the Gospel.

Renunciation, total and sweet.

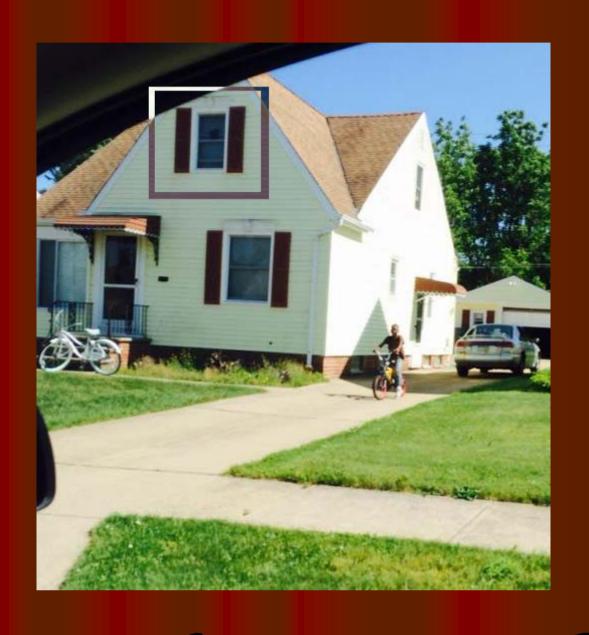
Total submission to Jesus Christ and to my director.

Eternally in joy for a day's training on earth.

"I will not forget thy words." (Ps 119:16) Amen.

Pascal's Prayer

Almighty God, who gave your servant Blaise Pascal a great Intellect, that he might explore the mysteries of your creation, and who kindled in his heart a love for you and a devotion to your service: Mercifully give us your servants, according to our various callings, gifts of excellence in body, mind, and will, and the grace to use them diligently and to your glory, through Jesus Christ our Lord, who lives and reigns with you and the Holy Spirit, one God, now and for ever."



What about today?

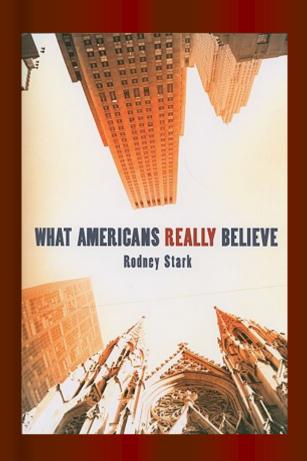
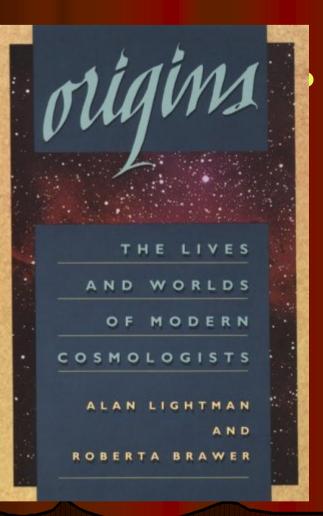


	TABLE	6
Percent of Americans Who Belong to a Local Congregation		
	1776	17%
	1850	34%
	1860	37%
	1870	35%
	1890	45%
	1906	51%
	1916	53%
	1926	56%
	1952	59%
	1980	62%
	1990	64%
	2005°	69%

What About Today?



"...contrary to popular myth, scientists appear to have the same range of attitudes about religious matters as does the general public." Alan Lightman



John Polkinghorne



Can Atheism be Debated?

Recall Peter Atkins



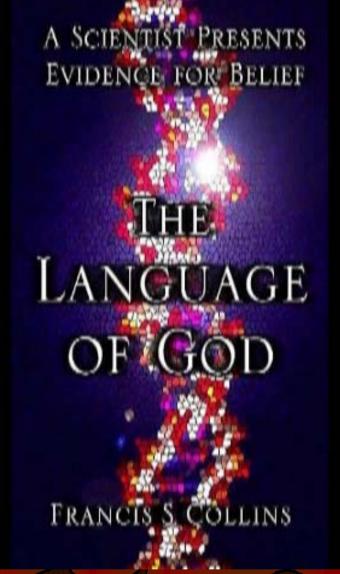
Peter Atkins with William Lane Craig

John Lennox



Christ is "the only solution that makes sense"

Francis Collins



Responding to question: "Did you have ... a born again experience?"

John Sanford



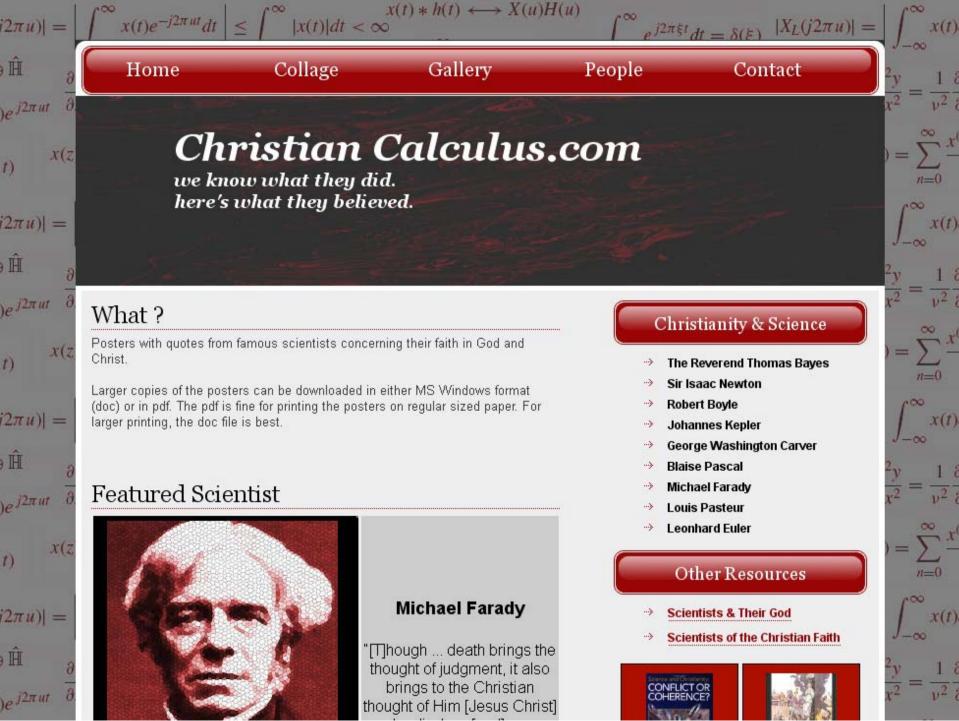
"We are dying because of the fall. Our only hope is Christ"

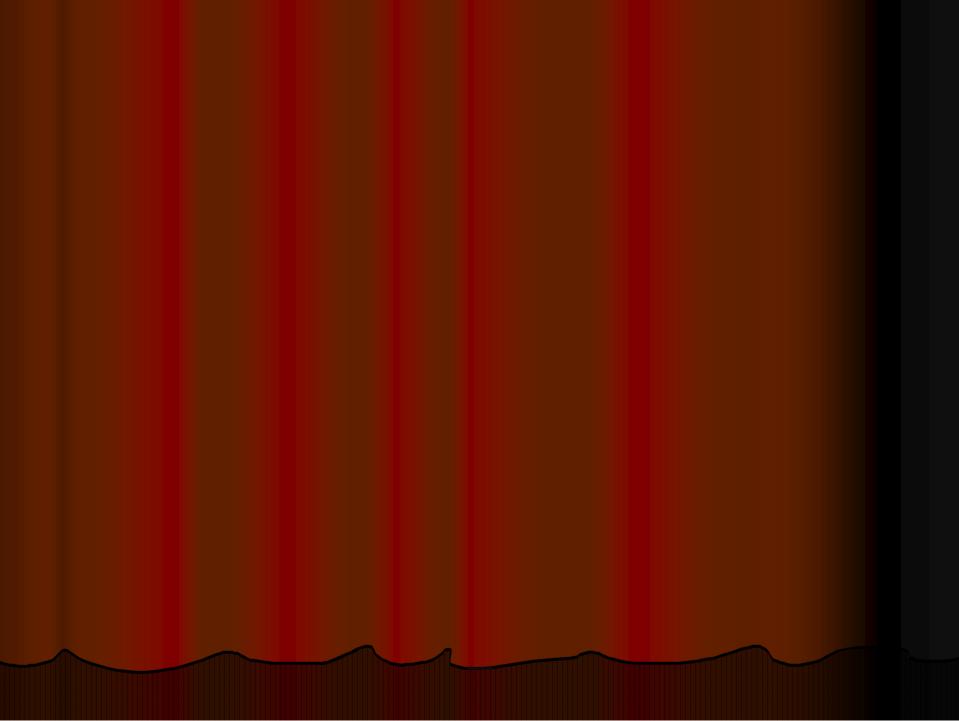
Takeaways...

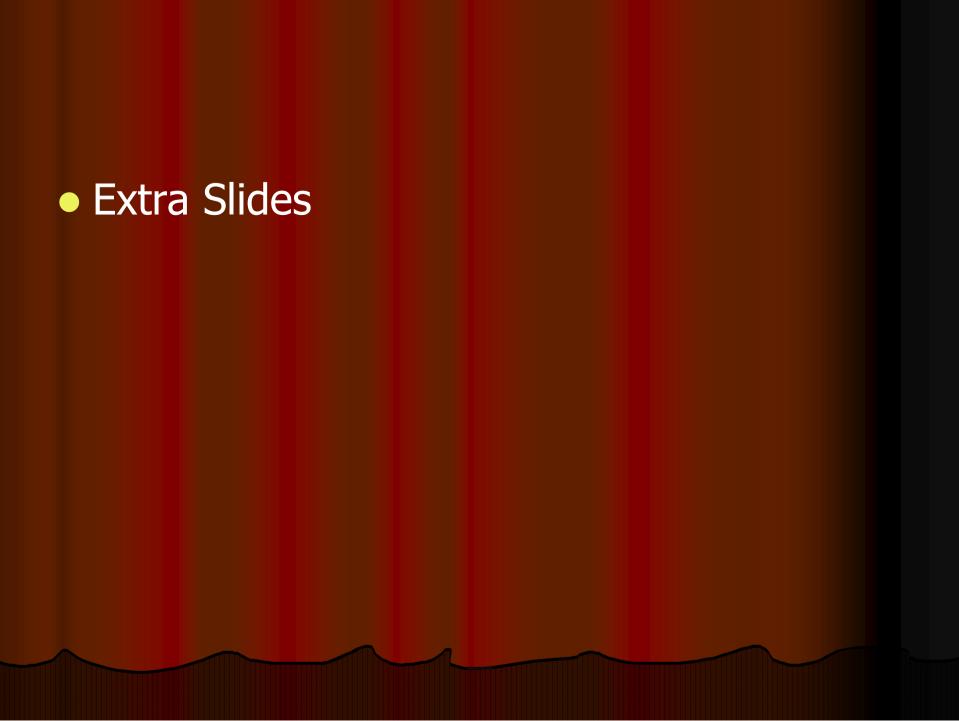


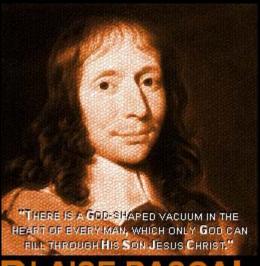
What is the appeal of Christ?

- Science and faith are not mutually exclusive. One illuminates the other.
- The battle is ideologicalnot scientific
- There is nothing new under the sun
- Faith in Christ is not correlated with intellect.
- Science apologetics run deep.



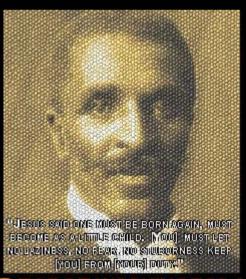






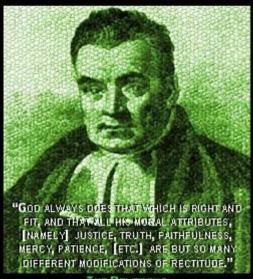
BLAISE PASCAL

METRICUNIT FOR PRESSURE PASCAL'S WAGER
INVENTOR OF PASCALINE COMPUTER
PASCAL'S NEGATIVE BINOMIAL DISTRIBUTION
PASCAL'S TRIANGLE



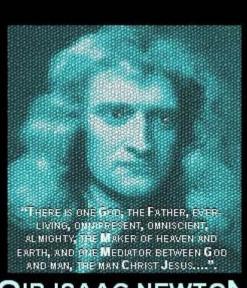
GEORGE WASHINGTON

AMERICAN BOTANIST & INVENTOR OF OVER 300
AGRICULTURAL PRODUCTS



THOMAS BAYES

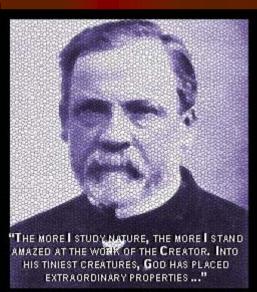
BAYES THEOREM
BAYSIAN INFERENCE BAYSIAN STATISTICS



SIR ISAAC NEWTON

Newton's Laws of Motion The Calculus
Metric Unit for Force Newtonian Physics
Newtonian telescope Universal Gravitation
Newton's Rings Newton-Raphson Method

More Info: ChristianCalculus.org



LOUIS PASTEU R

Pasteurization Immunology

Confirmed the Germ Theory of Disease

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Solomon's Sage Advice for Scholars...

